

REMARKS

In response to the non-final Office Action of June 25, 2009, applicant asks that all claims be allowed in view of the foregoing amendments and the following remarks. Claims 1, 22-26, and 28-37 are pending, with claims 1 and 26 being independent. Claims 1, 22-26, 28, 29, and 30 have been amended. Claims 2-21, 27, 38, and 39 were cancelled previously. Support for the amendments is found in the originally filed application at, for example, page 4, lines 16-30 and FIGS. 1-3. No new matter has been added.

Claim Rejections—35 U.S.C. § 103

Claims 1, 22-26, and 28-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,297,629 (Godard) in view of U.S. Patent No. 5,808,444 (Saeki).

Applicant requests reconsideration and withdrawal of this rejection for the reasons discussed below.

Among other features, amended claim 1 recites splitting batteries into at least two battery groups, with the batteries of each group being connected in series, connecting each of the at least two battery groups in parallel to a main voltage source for charging, and connecting the at least two battery groups in series to a load for use as the emergency voltage source. Splitting the at least two battery groups and connecting the at least least two battery groups in parallel to the main voltage source includes using a single switching device. The single switching device includes an element that is directly coupleable to each of the at least two battery groups such that the single switching device is configured to both split the batteries into the at least two battery groups and to connect each of the at least two battery groups in parallel. The at least two battery groups and the load are decoupled from the main voltage source by a diode device with at least one diode arrangement therebetween.

As discussed below, neither Godard nor Saeki discloses the noted features of claim 1. Moreover, the features of claim 1 realize benefits not sought or disclosed by these two references such that it would not have been obvious to modify these references to include the features of claim 1.

The Office acknowledges that Godard does not disclose “battery groups and the load are decoupled from the main voltage source by a diode device with at least one diode arrangement therebetween.” See Office Action at page 3. For this feature, the Office relies on Saeki, and, in particular, the diode D21 shown in Figure 13 of Saeki. However, like Godard, Saeki also does not describe or suggest this feature.

Figure 13 of Saeki shows an implementation of a charging-and-discharging device that includes battery packs 200, 200' and an electronic power consuming apparatus 270. See Saeki at col. 22, lines 16-18; 35-37. The apparatus 270 operates by being supplied by power from either of the two battery packs 200, 200' and from the external power supply (DC-IN). See Saeki col. 22, lines 48-51. The diode D21 is used to prevent the power from a battery from flowing back to the DC-IN side when the apparatus 270 is supplied with power from one of the batteries. See Saeki col. 22, lines 43-49; col. 22, lines 52-55. When DC-IN does not supply power to the apparatus 270, a control section 281 transmits an OFF signal to battery A to start discharging battery A, and the control section 281 transmits an ON signal to the battery B to maintain the battery B in an OFF state that prevents the battery B from discharging. See Saeki at col. 23, lines 12-16. When Saeki's batteries are in the OFF state, the battery is charged. See Saeki at col. 25, lines 5-8.

In Saeki, the diode D21, which the Office equates with the recited diode, prevents power from flowing back to the DC-IN side when the apparatus 270 is supplied with power from the battery A or the battery B. However, even when the apparatus 270 is supplied with power from one of the batteries (and diode D21 is in a state that prevents power from flowing back to the DC-IN side), there is still a coupling between the DC-IN side and the battery through the control section 281. See Saeki FIG. 13 (showing a connection between DC-IN and the control section 281). For example, and as discussed above, when battery A discharges, the control section 281 transmits a signal to battery B to maintain battery B in an OFF state, which allows battery B to be charged. As such, in Saeki, even when the diode D21 is activated to prevent power from the battery A from flowing back to the DC-IN side, there is still a coupling between the battery B and the DC-IN side through the control section 281. Accordingly, the diode D21 cannot be

equated with the recited diode, which decouples the battery groups and a load from the main voltage source.

Thus, for at least the reason, neither Godard nor Saeki describes or suggests that battery groups and a load are decoupled from the main voltage source by a diode device with at least one diode arrangement therebetween. Accordingly, applicant requests reconsideration and withdrawal of the rejection of amended claim 1.

Moreover, neither Godard nor Saeki describes or suggests that splitting battery groups and connecting battery groups in parallel to the main voltage source includes doing so using a single switching device having the features of the switching device recited in claim 1. The Office points to column 2, lines 49-53 of Godard and the relay RL shown in Godard's Figure 5 as disclosing "splitting the battery groups and connecting the battery groups in parallel to the main voltage comprises doing so using a single switching device." See Office Action at page 3. Applicant respectfully disagrees that the relay RL of Godard can be equated with the recited single switching device.

In the implementation shown in Figure 5 of Godard, the relay RL is connected between the collector of a transistor R1 and a terminal VC. See Godard at col. 7, lines 9-14. However, Godard's relay RL does not include an element that is directly coupleable to each of batteries BT1 and BT2, which the Office equates with the recited battery groups, such that the single switching device is configured to both split the batteries into the at least two battery groups and to connect each of the battery groups in parallel. The relay RL has contacts CT1 and CT3, and a contact CT4 is controlled by the relay RL. However, as seen in Figure 5 of Godard, neither of the contacts CT1 and CT3 are directly coupleable to each of the batteries BT1 and BT2. Moreover, even if the contact CT4, which is "controlled by the relay RL," could be considered to be included in the relay RL, the contact CT4 is not directly coupleable to each of the batteries BT1 and BT2. Rather, the contact CT4 "connects the two batteries in series via the diode D1." See Godard at col. 7, lines 15-18.

Accordingly, Godard does not describe or suggest splitting the batteries BT1 and BT2 into two battery groups and connecting the battery groups in parallel to the main voltage source

using a single switching device that includes an element that is directly coupleable to each of the battery groups. Saeki also does not describe or suggest a single switching device as recited in amended claim 1.

Finally, as explained on page 2 of the applicant's specification, the single switching device recited in claim 1 results in a symmetric design such that each of the at least two battery groups includes the same circuitry, which can reduce circuit complexity. In one non-limiting example drawn from the applicant's specification, Figure 1 shows a switching device 6 "acts as the splitting circuit 9 and the connecting circuit 10" and splits and connects the battery groups 4 and 5. Each of the battery groups 4 and 5 have a respective corresponding resistor 14 and 15. Thus, the same circuitry is used for each of the battery groups 4 and 5. As a result, the splitting and connecting circuits discussed in the applicant's specification are symmetrical with respect to the battery groups and achieve the simplicity of design discussed in the applicant's specification. This is a benefit not disclosed or suggested in either Godard or Saeki, nor is this a benefit that these references seek.

Accordingly, none of Godard, Saeki, or any proper combination of the two describes or suggests the noted features of amended claim 1. Moreover, one of skill in the art would not modify these references to include the features of amended claim 1.

For at least these reasons, applicant requests reconsideration and withdrawal of the rejection of claim 1 and its dependent claims 22-25. Amended independent claim 26 recites subject matter similar to amended claim 1, except claim 26 does so in the context of a device. Applicant requests reconsideration and withdrawal of the rejection of claim 26 and its dependent claims 28-37 for reasons similar to those discussed with respect to claim 1.

Conclusion

Applicant submits that all claims are in condition for allowance.

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be

exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this reply should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this reply, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed due. Nonetheless, please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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